EXCAVATING ON THE MOOR

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Over five seasons, the archaeology team of the UCL Bodmin Moor Bronze Age Landscapes Project, under the direction of Professor (then Dr) Sue Hamilton, conducted excavations on a number of still upstanding prehistoric structures on and below Leskernick Hill, Bodmin Moor (Bender, Hamilton & Tilley, 2007). Fraught with difficulties both because of the upstanding nature of the site itself and the peculiar pedological and geomorphological conditions prevailing on the moor (peculiar that is to an excavator used to working on truncated lowland sites), these excavations, many directly supervised by or overseen by the writer, represented a major interpretative challenge to the project. The present paper outlines the nature of that challenge, the lessons we learned from it as excavators, and, by applying these to the record from a second Bronze Age settlement (nearby Stannon Down), its relevance to the Bronze Age archaeology of the southwest and to excavation and excavators generally.

On the moor, as in any environment, an archaeological feature comprises a palimpsest of human activity, natural sediments, active and long dormant natural processes. Frequently the grammar of the different, overlapping texts is too complex to grasp at once, and for many excavators the initial recognition of a feature is intuitive. At times a thoughtful approach may in fact mask as much as it reveals — speed facilitating comparisons between the sediments being removed and sediments that remain (e.g. Fleming, 1988, 79). But ultimately intuition alone won't do. To grasp fully the meaning of a site and to communicate this to others, it is necessary fluently *to read*, *understand* and *to write* the language of natural process, and this requires a full knowledge of the geology out of which it is formed and the geomorphological and pedological processes to which it is subject. The forms of natural and anthropogenic features thus inscribed occur again and again, albeit in different combinations, and if accurately recorded during excavation can be recognized at a later date. By contrast, wrong or ambiguous interpretations arise out of the inability to distinguish between natural and anthropogenic features and the failure to recognize the need clearly to characterize and differentiate between them in print. For moorland sites the key words in this language of natural process are *horizonation* — for the soil — and *sorting* — for the stone. These are defined in terms of colour, texture, consistency, clast support, orientation and shape. Another important word, unfortunately often the final one, that cannot be avoided in discussions of moorland stratigraphy is *bioturbation*.

For the archaeology of southwest Britain, in particular the Middle Bronze Age settlement of Leskernick, Bodmin Moor (Fig. 1), where I acquired my knowledge of moorland stratigraphy, but also a range of other sites and categories of site, the interpretative implications of this reading or re-reading are potentially huge, for it is substantially upon sites like these that our knowledge of the later Bronze Age in that region rests. It suggests, for example, the reinterpretation of one important, widely reported structure (Stannon Down, site 6 — Jones, 2006, 348–9; 2008), and provides new explanations for a number of commonly observed moorland phenomena, touching on subjects as diverse as the configuration of houses to the abandonment of moorland settlement. But its implications go much further. Bodmin Moor is not the only moor to have been settled in the past — analogous environments and sites exist in many parts of upland Europe (in Ireland's Wicklow Mountains, on Dartmoor, in West Penwith, in Brittany, etc.), and what I have to say applies *directly* to the archaeology of these regions. And of course it is not only on the moor that soils develop and it is not only the moor that has geology. Excavation and the interpretation of excavation generally can benefit from a correct reading of site geology, geomorphology and pedology.

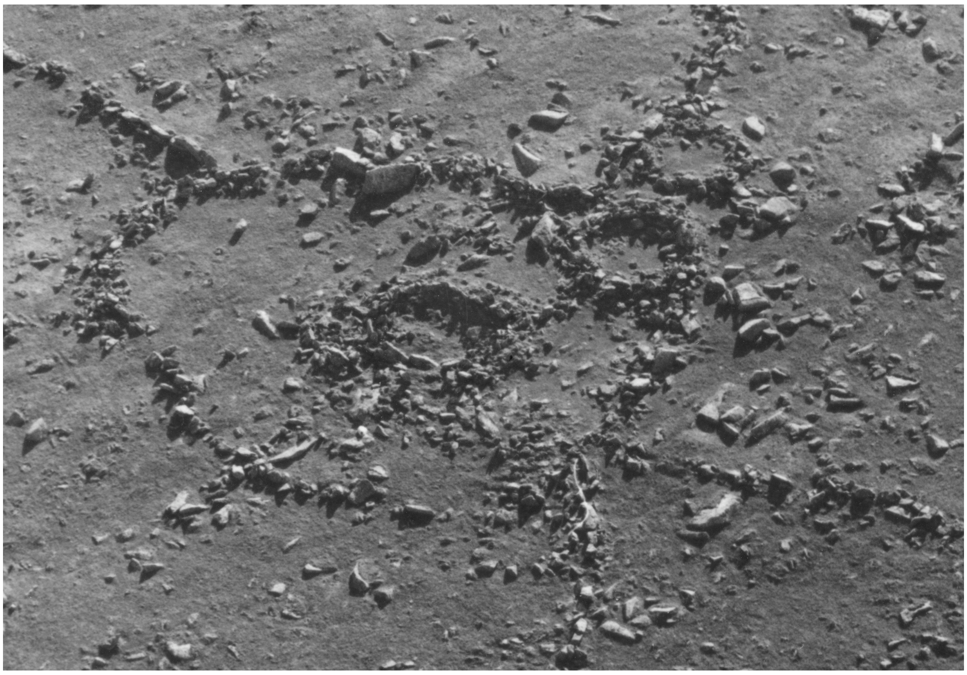

Figure 1.

The Southern Settlement on Leskernick Hill, Bodmin Moor. Looked at from the air, the circular and linear stone arrangements comprising the settlement stand out vividly again the natural clitter mantling the hill. House 39 is the larger of the two houses to the right. House 40 is just to the left of centre. *Photo: RCHME*

EXCAVATIONS AT LESKERNICK

Excavation was conducted in three areas, the Western and the Southern settlements on Leskernick Hill proper, and in a 'ritual' area, downhill of this. In all 10 sites comprising 22 separate trenches were examined (Bender, Hamilton & Tilley, 2007, fig. 1.4). Four and eight of these, respectively, were focused on or around classic stone-built roundhouses (Houses 1 and 39) (Figs 1 & 2), two on a ringcairn ('House' 23) (until our excavations believed to be a house) (Fig. 7), two on a stone circle (the North Stone Circle), and one each on features believed to be the terminal of a stone row, a cairn and an unidentified field feature (the Shrine Stone). The remainder consisted of sections through field boundaries.

Needless to say a lot of thought went into placing these trenches. We were unusually lucky to have the whole of an upstanding site to choose from but our time and our resources were limited and we had the responsibility of having fully to justify destroying parts of what we (wrongly) believed an unthreatened site. In addition the project was multi-disciplinary and had a number of different, although ultimately complimentary, research objectives that had to be reconciled in the field. We had to decide therefore what would add most to it. Chris Tilley wanted to excavate 'cairns' and a variety of possible 'field monuments' that our survey team had identified on the hill. There were good albeit conventional reasons why we should look at the field boundaries, the Stone Row Terminal and the North Stone Circle. In the end we looked at all of these but most of our time and resources went into excavating the roundhouses and the ringcairn, the pre-existing identification of which we had accepted at face value. The reasons for this were, firstly, that these were an obvious focus of human activity and could be expected to yield both structural and artefactual evidence relating to this; secondly, that all three appeared to incorporate elements that provided a possible

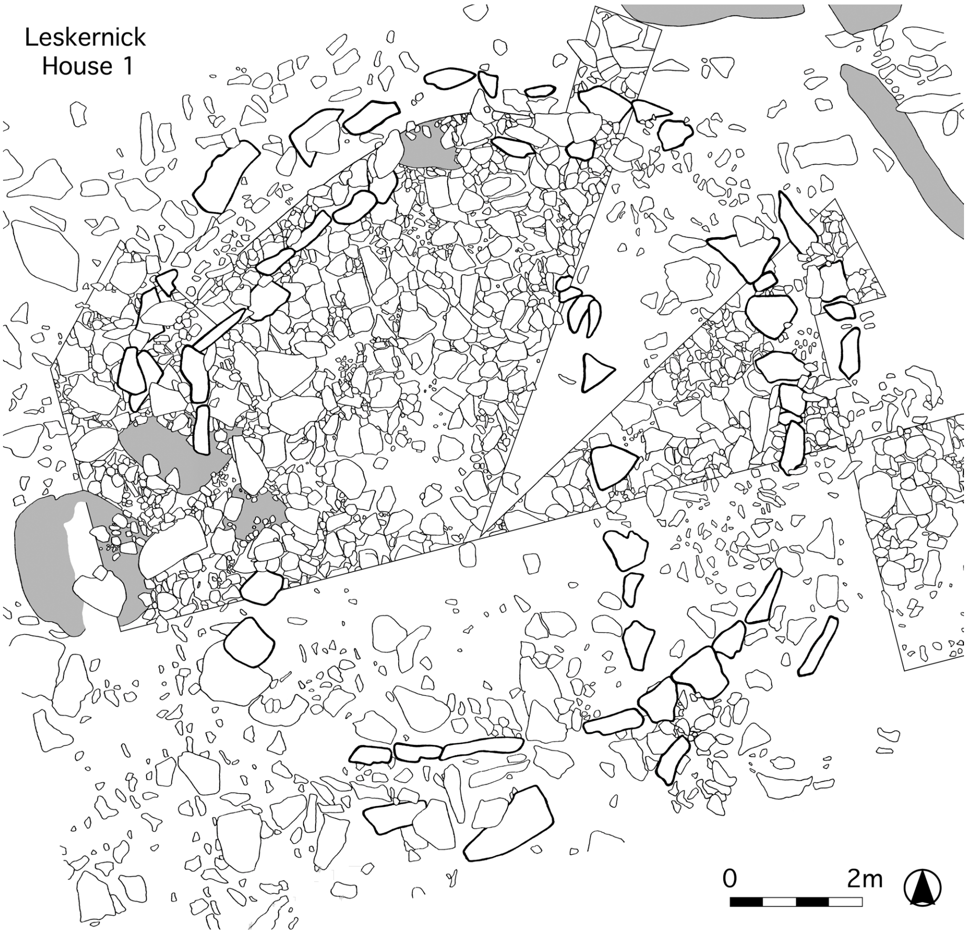

Figure 2.

House 1 in the Western Settlement. *Drawing: Sharon Adnitt & Jane Russell*

domestic parallel for the field monuments in which we were interested — a 'cairn', in the case of House 1, and prominent backstones in the cases of 'House' 23 and House 39; thirdly, because they provided likely catchments of chronological and environmental data; and lastly — a purely practical reason — their excavation concentrated what was mostly inexperienced student labour under experienced supervisors

Our method throughout was one of small open area excavations and targeted sections. This was made possible by the survival of archaeological features above ground. In House 1 (the last to be excavated), trenches quadranted the 'cairn', ran through the house from in front of the entrance to behind the rear wall, providing a section through it, sectioned the wall in four places and an interior partition in two, and opened up areas within, in front of and behind the house, within which the old landsurface and a range of features could be examined, before the trenches as a whole were excavated to the 'natural'. In doing this we generated data on the house's structure, the activities that occurred within and outside it and the environment of the site, and we resolved the true nature of the 'cairn'. 'House' 23 (the first structure within the settlement to be wholly excavated) was sectioned, the walls dismantled, the features emptied, and the trench taken down to the 'natural'. In addition a sondage from the level of the old landsurface was thrown across it in order to investigate what was at the time still an unfamiliar soil. This procedure — in appearance more dramatic than the other excavations — demonstrated the then difficult truths that the backstone comprised *in situ* clitter and that the structure was *not* a house. The excavation of

House 39, finally, was based on a quadrant system — like a barrow. Our initial aim was to examine the area around the backstone and thus the first quadrant was placed over this stone. Through the excavation of the remaining quadrants however we developed a programme of spatial and structural analyses analogous to those later conducted on House 1, and in our final season two additional exterior trenches were added in order to provide a sample with which that from House 1 could be directly compared.

THE BOOK OF THE SOIL

> 'Toto, I don't think we're in Kansas anymore.'
>
> Dorothy, in *The Wizard of Oz*

Leskernick settlement is situated on Head deposits. Below, and protruding through these, is granite bedrock. The Head comprises granite rubble or clitter, bedded in a matrix of degraded granite of an unmistakable yellow-brown colour, known locally as rab (Devon's 'growan'). Below the modern turf and mantling everything but the most prominent stones and structures is a layer of humic material of varying thickness. Within the settlement proper, excavation below the humic layer invariably revealed an incipient podzol or acid brown earth; downhill of the settlement, within the 'ritual' area of the North Stone Circle and the Stone Row Terminal, a gleyed or water-saturated podzol. These soils are characterized by highly developed horizonation. Depending upon one's position on the hill, there were four or five discontinuous but clearly distinguishable horizons (Figs 3a & 5), which in places overlay — and obscured — prehistoric cut features, and in places followed or lined them. Nowhere, however, did prehistoric features cut them. *The features, therefore, were earlier*. Preserved below both the walls of the settlement and some of the rubble from these, excavations also revealed traces of an earlier, less developed brown earth, and, later than Bronze Age features associated with them but earlier than the development of the overlying humic layer, patches of colluvium.

Podzolization

The moor's acid soils result from a lack of mineral bases released by the granite bedrock and an imbalance between precipitation and evaporation — unable to form compounds, soil minerals move down through the profile, where they form distinct horizons. Meanwhile humic material, owing to a lack of surface casting worms, which prefer base-rich soils, accumulates on or close to the surface. Soil profiles in areas unprotected by structures erected prior to acidification at Leskernick are divisible into three horizontal zones, all of which can be distinguished macroscopically. These form a set. The lower two comprise, firstly, horizons *from* which soil minerals have been removed, and, secondly, horizons to which soil minerals have been translocated. In archaeological terms these are not stratigraphic units but, as we will see, they frequently coincide with them. The upper zone results from the superimposition of new, organic material on top of the foregoing soils and sediments. This is a stratigraphic unit. A similar sequence of horizons has been recorded on prehistoric moorland settlements across the southwest (e.g. Fig. 3b & c and references below).

The uppermost horizons to develop *in* the rab comprise mostly colourless quartz granules in a dark grey, humus-rich matrix. These are Ah/ E horizons and they result from the translocation (eluviation) of iron from the profile. Equivalent horizons comprised Holne Moor's 'compact grey brown mineral soil' (Fleming, 1988, 79), Stannon Down's highly organic 'old land surface' (Mercer, 1970, 18), Shaugh Moor's

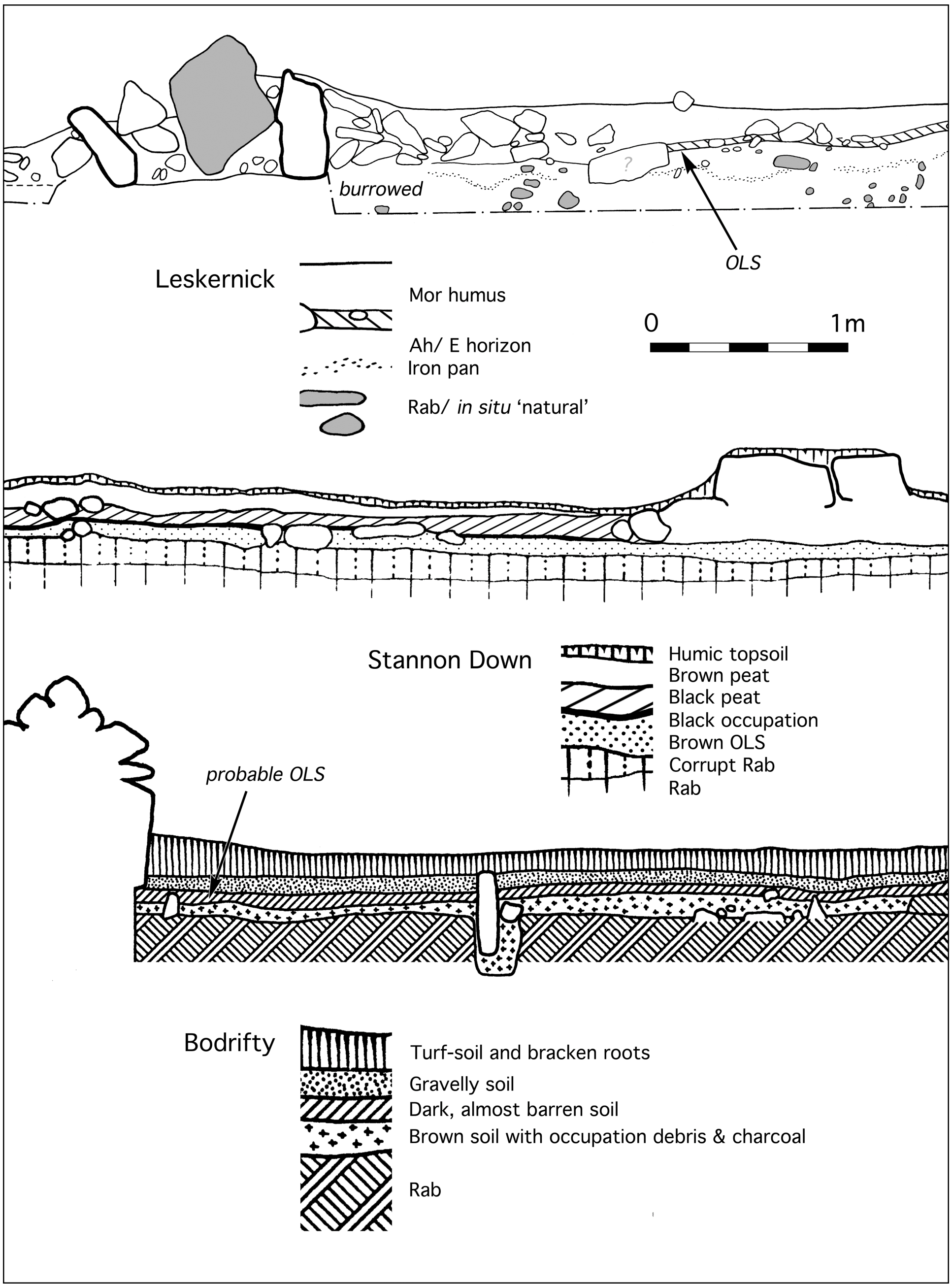

Figure 3.

Near identical soil horizonation in different prehistoric houses on Bodmin Moor and in West Penwith (adapted from Mercer, 1977, fig. 10, and Dudley, 1956, fig. 8). For Leskernick, note the concentration of clast-supported stone on the relatively stone-free old land surface, and the burrowed area beneath it, and for Bodrifty, the height of the post packing stones, the projection of stones *from the rab* into the immediately overlying horizons (which Dudley believed to be cultural) and the level of these in relation to the base of the wall. *Leskernick drawing: Jane Russell & Justin Russell*

'black gravel-rich upper mineral soil' (Wainwright & Smith, 1980, 69 & 79), Bodrifty's brown-black 'occupation levels' (Dudley, 1956, 3) and Heatree Down's 'compact dark brown soil' (Quinnell, 1991, 4, 12) and probably similar layers or horizons interpreted as anthropogenic at Kestor and Dean Moor (Fox, 1954, 30; 1957), and Tredarvah (Pearce & Padley, 1977, 25), the descriptions of which match those of the foregoing horizons but are insufficiently detailed to rule out with certainty their original anthropogenic interpretations. Cut features tend only to be visible in these if they are stone-packed (Figs 3c & 4 — cf. Fleming, 1988, 79; Mercer, 1970, 25–6). In the field, their interpretation as pedological rests upon their horizonal associations, their spatial and temporal relationship to archaeological features (on the hill, they were not present underneath Bronze Age structures), their diffuse interface with the underlying rab (cf. Dudley, 1956, 3) and the projection into them from the latter of small *in situ* granite boulders, which in a cut feature or an occupied surface such as a house floor could and most likely would have been removed (Figs 3c & 4).

In places, too, E horizons had been completely bleached out, owing to the leaching out of both iron *and* humus (Eb horizons). The most pronounced of these were excavated below two peat-filled pits in the North Stone Circle (Fig. 5), where they projected some distance below the actual cuts, creating — in one case — a plausible pseudo-pit. Here once again we were alerted to their true nature by their horizonal relationships, but also by their sedimentology, which was indistinguishable from that surrounding them, and their lack of functional logic as fills. Like the Ah/ E horizons, they had developed in a pre-existing sediment, the wet peat-filled cuts having created a favourable environment for this to take place. An Eb horizon, albeit much, thinner was also present in colluvium overlying 'House' 23, where, owing to its distinct silty texture, it was at first wrongly identified as ash.

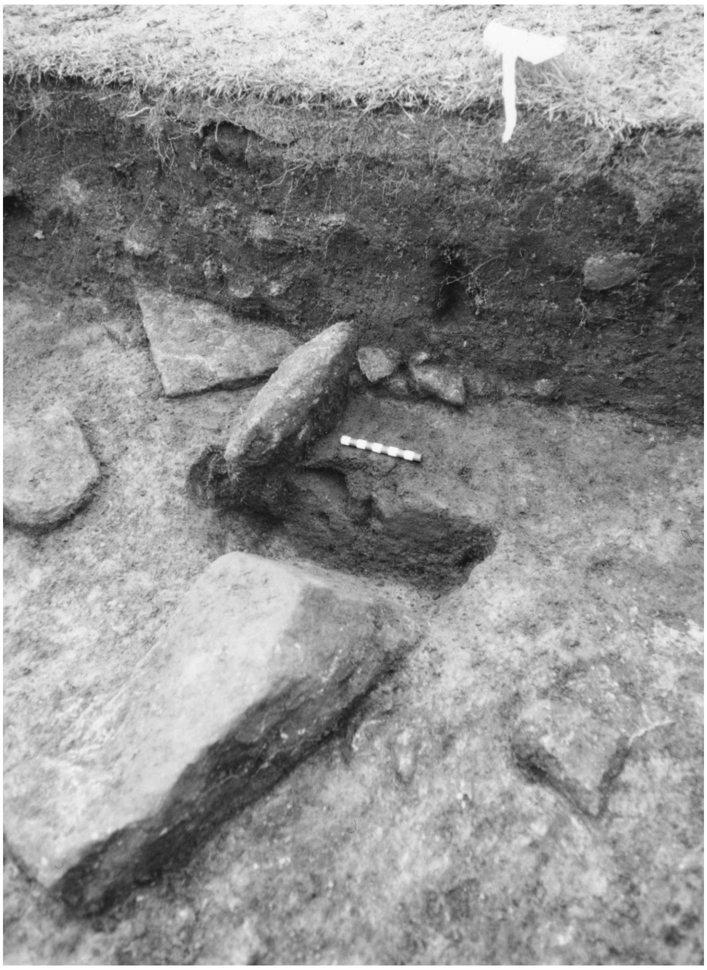

Figure 4.

Posthole in House 39. The house floor in this photograph is located just above the uppermost line stones visible in the baulk. As we excavated through this, only the upstanding packing stone heralded the possibility of a posthole below. Note the difference in weathering between the stone in the foreground, which comprises *in situ* 'natural' (it remains embedded in the pale rab), and the packing stone behind. *Photo: MST*

Finally, between A and E horizons, and the undeveloped rab, were clay and iron-enriched (illuvial) horizons. Differences in thickness, extent and shape reflected irregularities in both the parent material and the morphology of associated surface and sub-surface features. Lowest were iron-enriched horizons. Sometimes all that occurred was an orange Bs horizon. Commonly, however, there was a hard, deeply contoured iron-pan. These occurred, albeit discontinuously, below the floors of all three houses (Fig. 3), ran through the stone packed upper fill of a grave-like cut in 'House' 23, and partially lined a number of cut features excavated in Houses 1 and 39. In House 39, additionally, iron-panning was identified *on* the old landsurface under the wall and was present *below* the old landsurface under a wall joining Houses 39 and 40. Assuming no truncation — for which there is no other evidence — the iron-pan on the old land surface must have post-dated the overlying structure, since it couldn't have developed on an exposed landsurface. Possibly, however, the iron-pan below the joining wall pre-dated it. Iron-pan was also conspicuous below the two cuts excavated at the North Stone Circle (Fig. 5). Diffuse clayey or Bt horizons were frequently traced *above* iron-enriched horizons, but only on the hill.

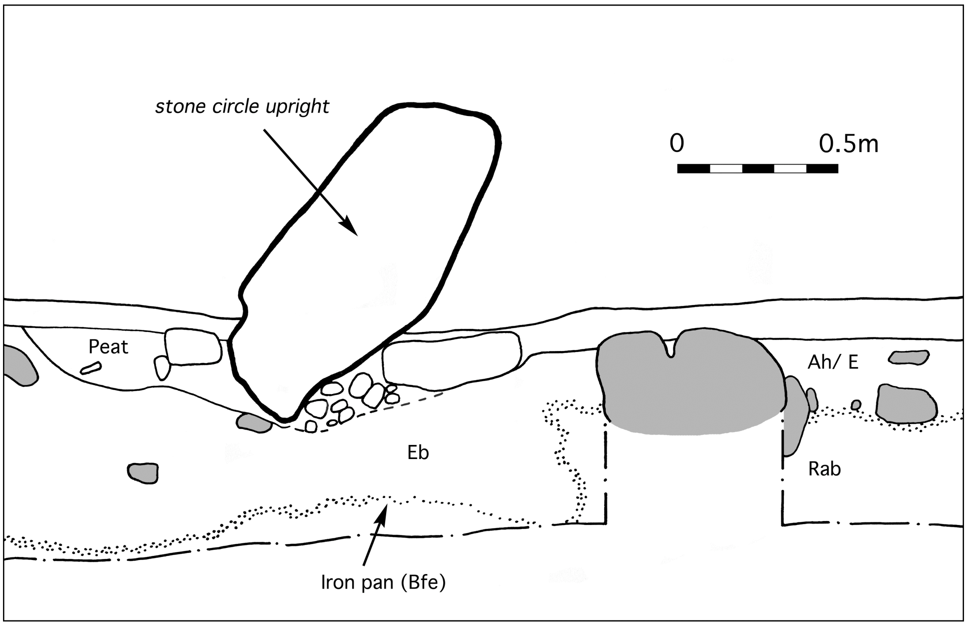

Figure 5.

Soil horizonation below the North Stone Circle. Drawing: Jane & Justin Russell.

Analogous clay and/ or iron-enriched horizons were noted at Colliford Lake and Stannon Down (the cairn excavations) (Maltby & Caseldene, 1984; Harris, Hooper & Trudigan, 1984), at Bodrifty (Dudley, 1956, 10, 18), and at Holne and Shaugh Moors (Fleming, 1988, 79; Wainwright & Smith, 1980, 69), but are not mentioned in reports on excavations carried out at Stannon Down settlement, where — most likely — they form a part of the excavator's 'corrupt rab' (Fig. 3b). Bh horizons, which result from the reprecipitation of humic material, and which occur above the iron-pan in fully developed podzols, were not recognized at Leskernick, either in the settlement or the 'ritual area', but occurred in buried soil profiles at Colliford Lake (Maltby & Caseldine, 1984, 100).

The uppermost zone at Leskernick included both mor-humus and blanket peat (Figs 3a & 5). Both represent the accumulation of organic material or litter *on* the mineral soil. Mor-humus comprises a completely humified greasy black layer overlain by a less humified layer with a browner colour and coarser texture. It is peat-like but occurs in better-drained locations. It was traced inside and outside all three buildings excavated at Leskernick, and it overlay the settlement colluvium. Owing perhaps to the excavator's failure to trace it *outside* the house circles, the lower greasy black layer of a similar horizon at Stannon Down was identified as an occupation deposit (Mercer, 1970, 18, 25) (Fig. 3b). The date when the inception of humus formation began at Leskernick is unknown but it need not have begun until some time after acidification commenced. Outside House 39 fragments of freshly broken granite, the debitage of stone harvesting (presumably for staddle stones, a complete example of which was found nearby), were found *in* the mor-humus, and in the Western Settlement, spoil from a leat associated with post medieval tin streaming overlay it. Downhill and in wet locations on the hill mor-humus graded into blanket peat. At Leskernick, where humic material abutted or overlay rubble structures, both in the settlement and the field system, it blended into a dark gritty humic soil.

Fossil soils

Excavation in areas of the settlement protected by Bronze Age structures and material from these revealed traces of earlier developed soils (Fig. 6). These stood out in appearance from the incipient podzols described above, but, owing to the long period to which they have been subject to later processes, tended to be much less continuous. At Leskernick patches were identified beneath the walls of Houses 1 and 39, a wall running between House 39 and 40 (see Fig. 1) and a cobbled layer outside 'House' 23, on the floor of House 1 (beneath tumble or collapse material from the wall), and beneath a deposit of colluvium identified against and upslope of the principal wall surrounding the Western Settlement. In terms of their physical appearance, they closely resembled Bronze Age fossil soils excavated at Colliford Lake (Maltby & Caseldine, 1984, 94) and Stannon Down (Harris, Hooper & Trudigan, 1984, 143). All comprised a grey-brown, weathered rab or Bw horizon, capped in places by a 2–3cm deep silty A-horizon of the same colour, thought to result from the activity of surface casting worms, and therefore indicative of a soil environment less acid than today's.

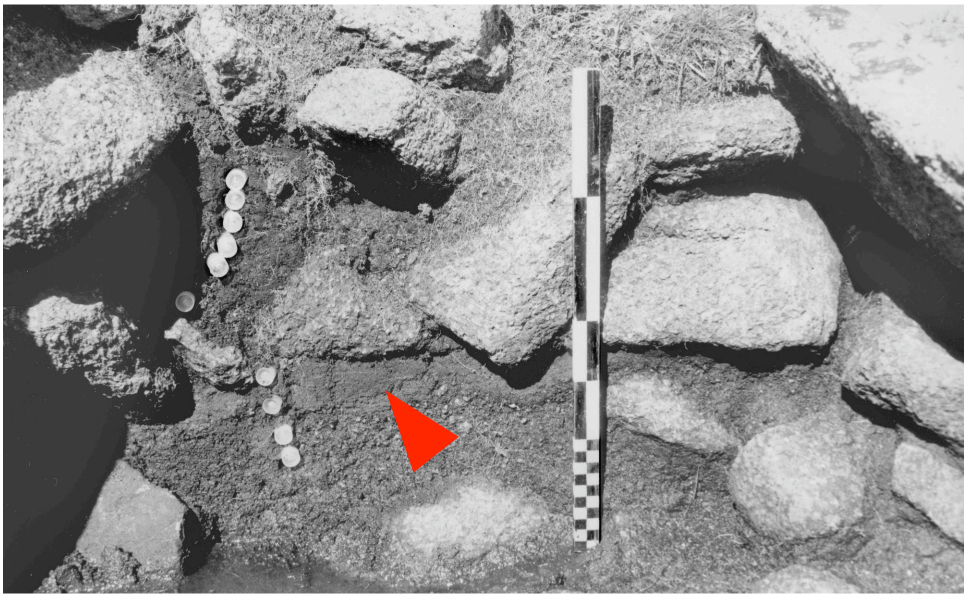

Figure 6.

The presence of worm sorted soils beneath both Bronze Age structures and *rubble from the collapse of these* showed that acidification on the moor post-dated the later. These excavated structures at least were not abandoned because of climatic deterioration. The example shown is from below a boundary wall close to House 1. *Photo: Sue Hamilton*

The identification of these soils is important for three reasons. Firstly, their presence below excavated buildings and walls shows these to pre-date the commencement of acidification on the hill, a view consistent with my earlier observations on the relationship between acidic soil profiles and excavated features. Secondly, the worm-sorted horizon on the floor of House 1 shows acidification in this building to have begun *after* — and probably long after — it had lost its roof and collapsed. We cannot therefore attribute its abandonment to a change in climate.

Rather, houses in the settlement — including House 1 — were abandoned piecemeal during this period, or as a group, succumbed to a different kind of catastrophe altogether (radiocarbon dates from the site, although placing the primary occupation of the houses in the Middle Bronze Age, allow both possibilities — Bender, Hamilton & Tilley, 2007, table 4.1). Finally, the presence of surface casting worms on site will have effected the distribution of finds and the morphology of features, both through worm sorting and by encouraging the activity of moles (cf. Fleming, 1988, 89, who inferred the existence of a similar soil environment on Holm Moor from the presence of mole holes).

Lost in translation?

The relationships described between soil horizons and between these and archaeological features are key to understanding the site from the simplest level of the recognition/ correct identification — or not — of features, to my inferences regarding the possible reasons for structural abandonment on the moor. Take the North Stone Circle. Had we not identified the Eb horizons for what they were, we would now think the propped stone above one of them had been positioned on top of a pit, a potent, if utterly false image. Conversely, had we mattocked the sediments off the floor of House 1, looking for postholes, we would not now be able to suggest that it was abandoned prior to the commencement of climatic deterioration on the moor. The *Book of the Soil*, however, is not an easy read, nor are the translations in which it occurs necessarily full and correct. It is possible therefore that some important relationships remain unknown to us. What, for example, of the 'dark gritty humic soil' into which the mor-humus graded when it abutted or overlay rubble structures, to which I referred above? It isn't in the book. (My guess is that it developed *in situ*, as the rubble decayed and the mor-humus developed around it). And what of the things we didn't see because we *didn't* mattock through the floor of House 1? They aren't in the book either. Luckily for Leskernick, however, we had many chances to get our pedological interpretations right.

I will return to some of these issues below.

A STONE WORLD

> 'We believe that the people of Leskernick hill regarded the stones as animate sentient beings, the opposite of a modernist belief system in which the stones are simply regarded as inanimate objects to be exploited at will.'
>
> Chris Tilley *et al.*, 2000, 221.

A 'palimpsest'. The metaphor falls down here because the first things inscribed on the moor, geology and geomorphology, are the most difficult to rub out and provided — as with the texts that follow — the reader understands the language in which they are written, the easiest to read. They are easiest because of their scale. For us working on the moor soil horizonation was catenary, that is to say it changed minutely downhill. By contrast the differences that we encountered in the geology and the geomorphology were on a huge scale. But herein lay the difficulty. Frequently geology and geomorphology projected right through the archaeological stratigraphy; and always it continued beyond the limits of our excavations. It was not possible therefore to contextualize it fully — sometimes to the detriment of both geomorphological *and* archaeological interpretation. Moreover the inevitable incorporation of such features by the moor's Bronze Age inhabitants into their world meant tackling archaeological features that were quite literally natural.

The prominent backstone of 'House' 23 sums up this complex relationship very well. This stone and others like it were considered so potent by the survey team that when a house was surveyed and found not to have a prominent backstone this was described as missing, not absent (Chris Tilley, pers. comm.). When 'House' 23 was excavated, however, the backstone proved to be part of a natural clitter flow, the meshing of which had caused it to be levered upright. Indeed *many* backstones on the hill are *in situ* natural. Because they are large or, like that of 'House' 23, they had been trapped, they blocked the passage of stone down the hill creating handy 'clearings' (Fig. 7). It was on these that people chose to build their houses, with the result — intentional or not — that they created an actual link between nature and culture. Archaeologically this was something we couldn't ignore. But because it was natural, *contra* Bender, Hamilton & Tilley (2007, chapter 9), it was never possible to resolve whether its cultural associations were incidental or deliberate, and, if deliberate, whether these were just practical or something else.

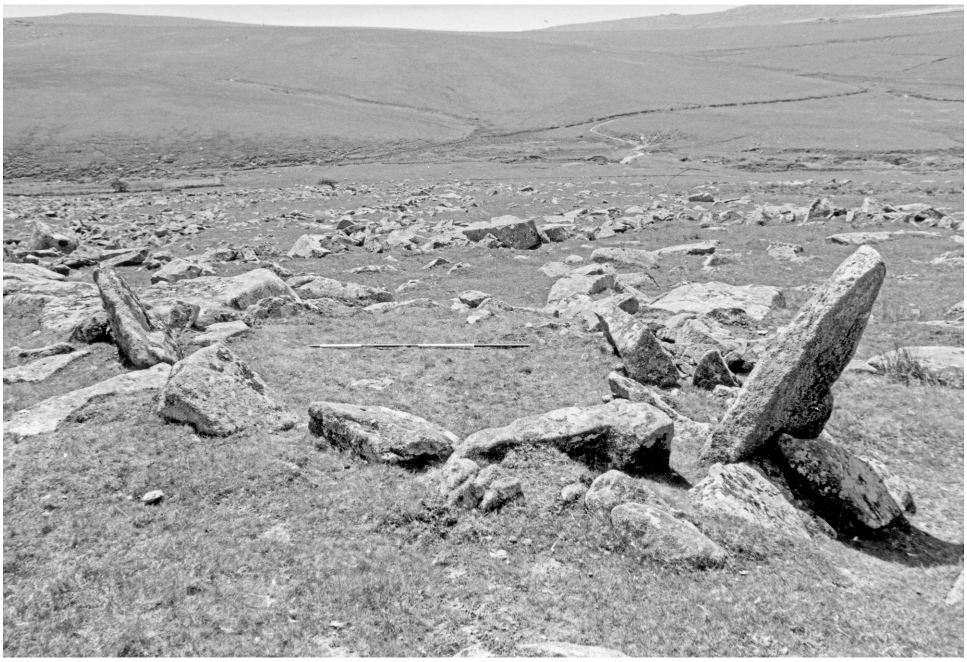

Figure 7.

Bronze Age structures were often sited on clitter-free areas of the hill, created when the natural passage of stone downhill during periglacion was blocked — frequently, as in 'House' 23 (shown here), by a large stone. *Photo: MST*

Geology and geomorphology

Five different types of stone occur naturally on Leskernick Hill. The bulk of it is medium grained biotite granite, the usual granite of Bodmin Moor, and the principal source of the gritty rab into which the clitter is set. This is shot through with thin veins of quartz, some massive and unformed and some vughy with fully developed crystals in the voids, and with thin veins of a grey black, very fine-grained quartz-tourmaline. Additionally, on the Western Settlement, boulders of microgranite, which is intruded into the granite in the form of veins and dykes, are present in abundance, indicating a significant, unmapped intrusion in this area.[1]

The patterns these stone takes in the clitter and in the underlying rab are largely the product of their movement downhill during soliflution, a periglacial process in which they are repeatedly lifted and dropped by the freezing and thawing of groundwater. The patterns generated by solifluction are far from random. I have already referred to the way stones are levered upright and how gaps in the clitter are formed. Additionally, the long axes of stones are aligned downhill, stones ride-up, rather than under each other, and raft over the surface of the rab. It must be emphasized however that these are trends, not rules. Individual stones, because they or the periglacial structure of which they form a part are not wholly visible, or because they joined the flow — having split from another stone for example — at a late date, or because they were subject to some other process or processes, may appear to, or in actual fact not conform (e.g. the frost spall in Bender, Hamilton & Tilley, 2007, 203 & fig. 8.1c).

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[1] The other stone of local origin — it was found in the undisturbed rab — was green and full of irregularly orientated mica. Apparently a product of thermal metamorphism, at the time of writing it remains unidentified.

Undisturbed granite in upstanding clitter is always deeply weathered and not generally of high quality. Stone exposed to the elements acquires a rough surface through the differential weathering of the minerals comprising it, although its naturally pale colour is unchanged. The corners of individual stones are rounded. Stone excavated from the rab is iron-stained (so when burned in an open fire, reddens),[2] less rough, and more angular. It is therefore easy to tell them apart (Figs 4 & 8). For example, the backstone of 'House' 23' referred to above proved on excavation to be weathered quite differently above and below ground, adding greatly to the confidence of our interpretation of it as *in situ* natural.

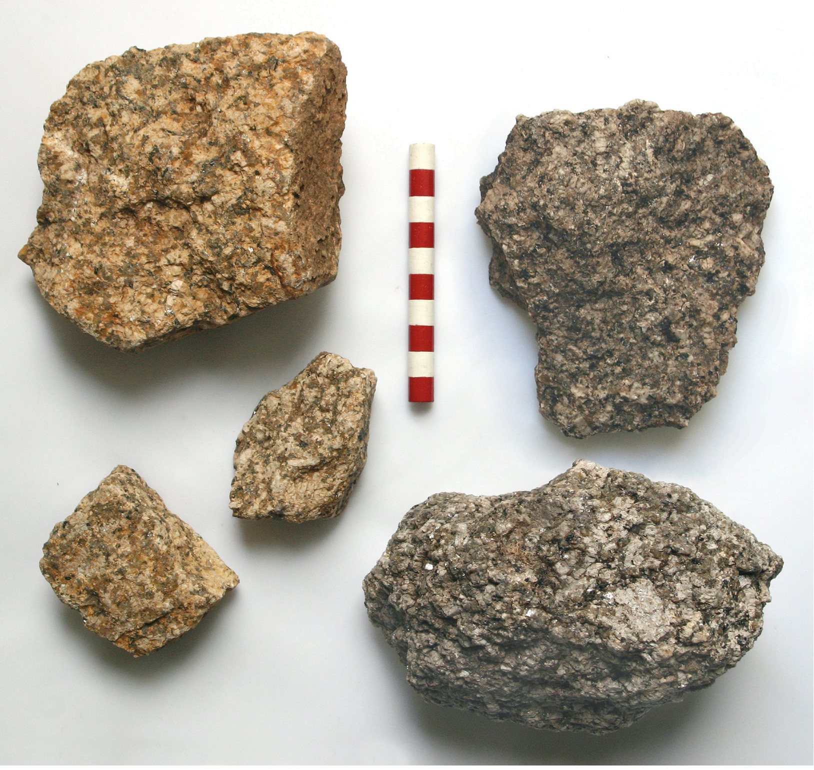

Figure 8.

Granite from the excavation. That from the rab (left) is smooth and iron stained; that from the surface of the hill (right), deeply weathered. The sub-concoidally fractured stone (upper right) was struck relatively recently from the main upright of the Stone Row Terminal. *Photos: MST*

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[2] Stones excavated in the entrance area of House 39 — and elsewhere on the hill — had a grey surface rind. On analysis, these rinds proved to be carbon-enriched. Carbon-enriched rinds on burnt stone are widely associated with burning underground and in other oxygen-free environments (e.g. Thoms, 2008, fig. 9). Identical stones were observed in West Penwith after a moorland fire (Gary Robinson, pers. comm.), during which oxygen would have been similarly sparse, and it is assumed that the Leskernick stones result from similar event(s) there.

Finally, like clitter, collapsing man-made features — including Bronze Age roundhouses, cairns and field walls — are subject to 'natural' slope processes. They too have a directional fabric, are subject to blockages, and — depending on the size and shapes of the stones comprising them, and the slopes formed by them — they *may* be naturally sorted. However, unlike periglacial and man-made features, they rarely incorporate stones orientated *against* the flow, and *never* neat lines and/ or circles

Distinguishing features

Excavating prehistoric stone features on the moor can be as problematic as excavating earthen ones. In part this is because of soil processes, which obscure their stratigraphic relationships, in part because the stones comprising them are themselves 'natural', i.e., most are unaltered 'field stone' moved a short distance only from their source amongst the clitter, and in part because of the effect on them of ongoing geomorphological processes. In House 1, it proved so difficult to distinguish between a flagged surface and wall tumble that overlay it (Fig. 9) that a number of flags were stripped off with the tumble. The flags had been undermined by animal activity, the orientation of the stones comprising the two contexts altered, and the sediments above and below mixed. The latter meanwhile remained pedologically active. Likewise it was impossible to distinguish with certainty stone from House 39, stone from adjacent wall structures and stone from a natural clitter stream on which the house impinged. In each case the direction of slump or flow was the same — downhill. And again, to the rear of 'House' 23, a deliberately cobbled layer was only distinguished from a natural stone raft, an example of which was excavated below the Shrine Stone less than 50 metres away (Bender, Hamilton & Tilley, 2007, fig. 8.1), because of the presence beneath it of a worm sorted soil that produced a plausible Bronze Age pollen profile (Martyn Waller, pers. comm.). In general, however, stone features proved easier to recognize, excavate and interpret than those comprising finer sediments.

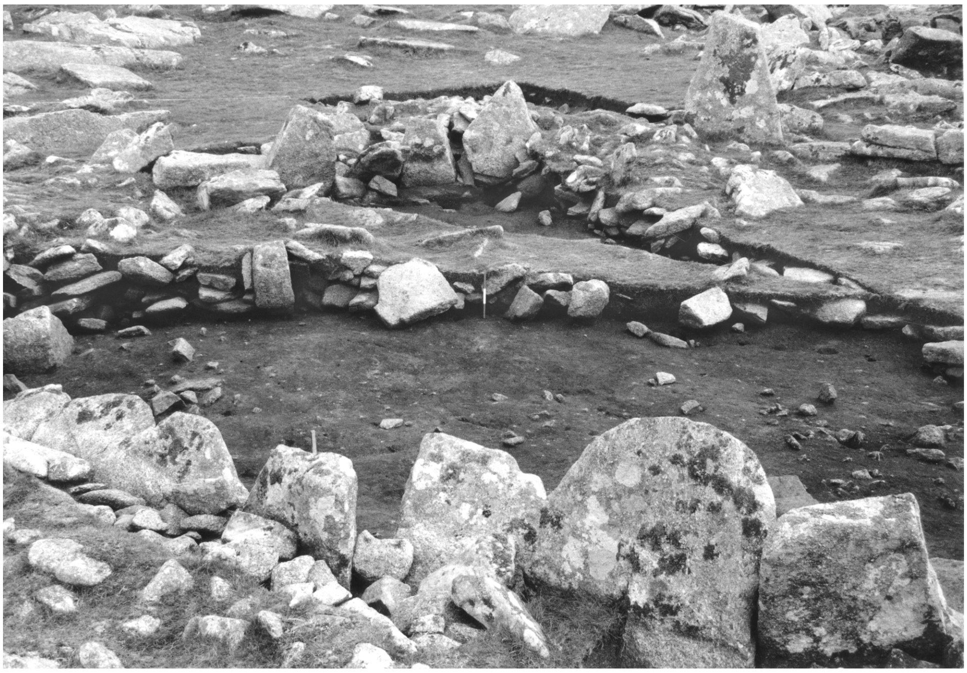

Figure 9.

Rubble lying on the more or less stone-free floor of House 1. As well as differential weathering (Figs 4 & 8), the interface been *in situ* 'natural' and culturally derived stone on the moor is often characterized by differences in clast-support. The stones here include a flagged surface, which has been undermined by burrowing, and material from the collapse of the house wall. *Photo: Fay Stevens.*

The extent to which prehistoric stone features on the moor are distinguishable as such — or not — depends on their correspondence with the characteristics outlined above. At Leskernick, as on many other Bronze Age sites (e.g. Stannon Down and Wicca Round, Zennor — Dudley, 1958, fig. 4; Mercer, 1970, fig. 8), walls are faced with, or demarcated by, boulder-sized stones: there is an unnatural juxtaposition of large and small stones (Fig. 2). There is the recurrent selection of large *in situ* boulders for primary backstones and house thresholds (House 1, 'House' 23 and, possibly, Stannon Down — *see* below) (Figs 2 & 7). Different structural elements moreover can be distinguished by their orientation (for example 'tie beams' in House 39), and, of course, there are the circular and linear orientations that draw attention to these sites in the first place (Figs 1 & 2). Rubble from or forming structures and *in situ* clitter may also be distinguished by its patterning. Given a large exposure, natural features — such as a stone raft — *should* exhibit the downhill orientation described, whereas deliberate cobbling or flagging is more likely to be randomly orientated. Collapsed structures may also display a directional fabric that differs from that above or below them. Owing to a change in that within a rubble pile against the rear wall of House 1, for example, two different depositional episodes were inferred. In the first, clasts had fallen from behind a collapsed external facing stone; in the second, rubble had been piled on top, possibly to shore up a still upstanding internal facing stone. (This was the 'cairn').

Excavated *in situ* natural stones, both within and below the developed soil are often matrix-supported, whereas stone structures and rubble derived from the collapse of stone structures tend to be clast-supported. In nearly every structure excavated at Leskernick this difference marked the level of the Bronze Age land surface (Figs 3a & 9), our principal benchmark. Its identification made it possible to establish, firstly, the nature of the house floors (were they horizontal, like those of houses on the chalk — no; had they been cleared of surface stones — yes); secondly, the depth of features cut into these (Fig. 4); and, thirdly, whether positive features such as the walls lay in or on them (mostly they lay on them — Fig. 3a). Additionally, it was possible within it to discern stone-packed features such as postholes, including some that were insufficiently deep to show up in the rab below. Surfaces overlain by mor-humus alone or colluvium were more difficult to define. Finally, where cultural stone interfaced with *in situ* natural stone, be it on the old landsurface or below it, the difference in weathering enabled us to distinguish between them. Even when stone from the rab had been incorporated within surface structures, although it lost its colour, it retained its telltale surface appearance. From the occurrence of such stones in the wall of House 39, it was possible to infer the existence of a pre-existing cut, which demonstrated that House 39 was secondary, and a long-lived matrix for the wall fill itself.

Written in stone

In conclusion I would direct the reader to the accounts of excavations at Shaugh Moor, Dartmoor (Wainwright & Smith, 1980), and that of a 'ringcairn' excavated by the former Cornish Archaeological Unit at Stannon Down (Jones, 1998), and reinterpreted by me below. These accounts could hardly be more different. The drawings of structures at Shaugh Moor look a lot like ours. The drawings of Stannon Down are much more stylized. But both represent *interpretations* of what was — or what was not — cultural. In view of the number of stones involved this is hardly surprising. On moorland sites total recording of these is impractical, even photographically, and where it is achieved, it may be unpublishable. Stones *have* to be edited out. As noted above, however, it is not usually individual stones that are important interpretatively but geomorphological trends. The examples from Leskernick given above reflect our observation of such trends there and my re-interpretation of the Cornish unit's cairn is based upon the recognition of similar trends in the record, both written and drawn, of that site. The same — I am thinking in particular of the differential sorting of stones — is evident in the Shaugh Moor drawings.

These were modern, well-excavated and well-recorded sites. Earlier traditions of excavation made more of a point of clearing away the rubble, so to speak. Nonetheless at a site like Bodrifty we can clearly see the relationship of the stones comprising the wall of house A to the floor — as reinterpreted above (Fig. 3c) — and at Heatree Down, although tumble from the walls of buildings has become a series of un-textured layers (e.g. Quinnell, 1991, fig. 2, layer 2), its relationships remain both clear and interpretatively viable.

But what of link between the two: culture and nature? Prior to the commencement of our work on the moor natural stone features hardly featured in excavation reports at all. A few stones projected out of the rab at Bodrifty (Fig. 3c), Colliford Lake (Griffith *et al.*, 1984, fig. 9) and Stannon Down (Mercer, 1970, fig. 9), and out of the growan at Shaugh Moor (e.g. Wainwright & Smith, 1980, fig. 7), Heatree Down (Quinnell, 1991, fig. 3) and a number of other Devon sites, but they didn't feature in the interpretative texts. From the perspective of our excavations on Leskernick Hill this seems extraordinary. Insofar as the link between culture and nature was an integral part of life on the moor, methodologically, it is integral surely both to its excavation and its interpretation. At this point, however, we diverge from traditional archaeology, for the difference between us is of course conceptual rather than practical. To archaeologists of the last century *in situ* geology — the 'natural' — was the point at which work stopped. To those of the present century the 'natural' is an interpretative challenge still waiting to be overcome. What we have tried to do it bring the two together.

MOVEMENT ON THE HILL

Apart from we archaeologists the site's only human visitors today are soldiers on exercise, walkers and riders, and the occasional commoner seeing to his or her animals. At several periods, however, it has seen much more intensive activity. The result of this has been colluviation, the transport and re-deposition of disturbed soil. The excavations sought to find arable colluvium against the field boundaries downhill of the settlement. This was *not* present — which is itself of interest — but colluvium was found within the settlement. In plan this was indistinguishable from the upper surfaces of the developed rab, but in section a slightly different texture rendered the interface between them visible (Richard Macphail, pers. comm.); moreover soil horizonation tended to follow it. Thus outside House 39 an iron-pan developed on the landsurface buried by it and in two locations on the Western Settlement it was characterized by bleaching. To what period it belongs exactly is uncertain but it post-dated 'House' 23 and the principal wall of the Western Settlement, both of which it partially buried, and pre-dated the development of the mor-humus, which overlay it. Maybe it relates to the construction of houses during the Bronze Age — an analogous deposit considered to have been generated by settlement activity was identified at Stannon Down, where it lay against an undated cairn (Jones, 2001, 15); maybe it relates to much later activity. We don't know. What matters is that it too buried things, including at Leskernick a cobbled surface, the best preserved Bronze Age fossil soil found and the only useful pollen sequence recovered from the settlement, and a good part of the hill besides.

BURROWING ANIMALS

> 'Three main construction types of [vole] burrow systems emerged: long drawn out linear burrows, compact and tight burrows, and burrows comprising both compact and linear parts... The largest burrow had a subterranean length of 70 m, the shortest only 0.5 m, the average being 16.9.'
>
> Brügger, Nentwig & Airoldi, 2010, 313.

Of all the soil processes now and formerly active on the moor, the most destructive of the archaeological text is animal burrowing, which like the book worm, has the potential — often realized — to remove it altogether. At Leskernick we estimate that least forty percent of the soft sediments excavated by us in archaeologically significant levels had been reworked by burrowing animals (70% of the floor surface in House 39), while stone features were undermined, distorted, buried and — we strongly suspect — destroyed *and* created by them (Figs 3a, 10 & 11). 'Missing' postholes in Houses 1 and 39, for example, were all in areas heavily reworked by burrowing, while the very irregular surface of flagging in House 1 is certainly attributable to it.

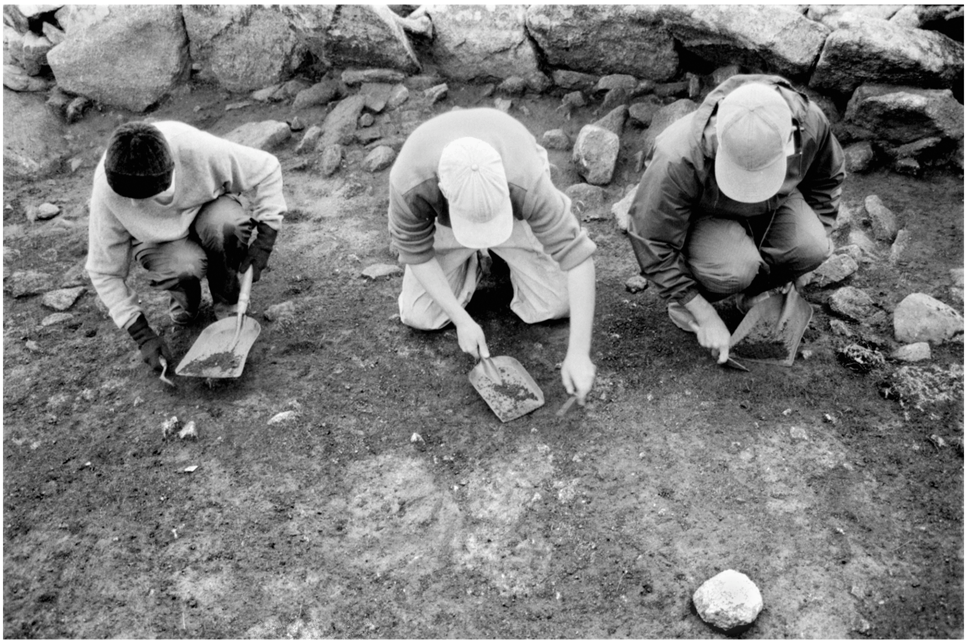

Figure 10.

Burrowing below the floor of House 1. There should have been a posthole here. *Photo: MST*

Burrowing animals, irrespective of species, cause damage to archaeological sites in three ways: by digging holes; by moving artefacts within burrows and from burrows to the surface; and by burrowing under them, undermining stone and other features. They differ in terms of burrow size, the distance they transport soil, the size of material they move, and where exactly — horizontally, vertically and in relation to what other features — they do these things. To date, discussion of burrowing animals on archaeological sites in British moorland environments has focused primarily on moles and rabbits (e.g. Fleming, 1988, 89; Dunwell & Trout, 1999). What we had at Leskernick was the common vole (*Microtus arvalis*). The average depth of common vole burrows is about 12cm — at Leskernick today, more or less the level of the old landsurface. Their burrows are of small diameter, rarely more than four or five centimetres in diameter. Owing to the cost of transport, they neither move soil far, nor move stones of any size, the largest usually ejected falling between 5 and 10 mm (Jean-Pierre Airoldi pers. comm.), which is smaller than most of the finds recovered by us during towelling and included in our detailed finds distributions. Active burrow openings are often within less than a metre or so of each other (Brügger, Nentwig & Airoldi, 2010, fig. 1) (Fig. 11), but burrowing is constant, and the network of burrows and burrow openings in use changes constantly. At Leskernick burrows concentrated around the walls of the houses where there were many stones but few portable artefacts. Thus while the damage done to features was considerable it is possible that horizontal displacement of finds was minimal, a view confirmed for House 1 at least, by the survival there of coherent artefact distributions. Finds moved vertically but not horizontally.

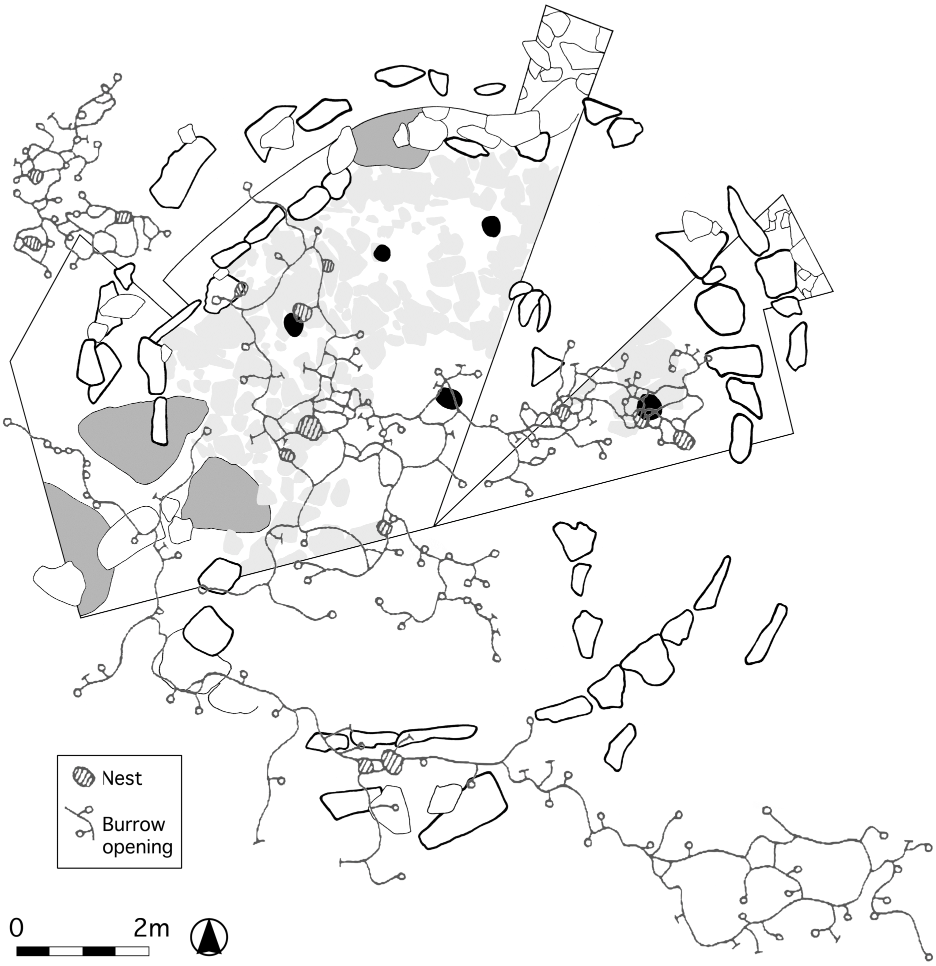

Figure 11.

Typical compact and linear vole burrows (adapted from Brügger, Nentwig & Airoldi, 2010, fig. 1) overlain on House 1. A nest area or repeated burrowing can easily remove an earthen feature. Vole burrowing, however, will not move finds very far — at least horizontally. In House 1 the flagging (greyed) had been undermined and the post ring was most likely incomplete, but it is possible that the finds distributions genuinely reflect the distribution of activities inside the house (for example, slate and white quartz had very different distributions). *Drawings: Jane Russell & MST.*

Owing to the soil processes described above, only active vole burrows were visible within Leskernick's upper soil horizons, whereas in the rab below, both active and fossil burrows showed up clearly: in part because of their browner colour and in part because they comprised finer, clay and silt-sized sediments (further evidence for the limited impact of vole burrowing on finds distribution). Some were *lined* by iron-pan, demonstrating the time depth of vole activity, while some penetrated it. Vole burrows filled with mor-humus *must* have been of post-Bronze Age date; whereas burrows filled with mineral sediments, might in some cases have been earlier (cf. Fleming, 1988, 89). This burrow-ridden zone is certainly part of Mercer's 'corrupt rab' (1970, fig. 10).

READING AROUND — A COMPARATIVE ANALYSIS OF ASPECTS OF THE RECORD FROM STANNON DOWN

> 'Excavations... revealed that most of the 'roundhouses' investigated were in fact ring-cairns of Early to Middle Bronze Age date. They had been identified [as] roundhouses because they were located near to a known roundhouse settlement. This resulted in a series of assumptions about the nature of the newly discovered sites; ring-cairns were identified as poorly-preserved roundhouses, a small cairn was interpreted as clearance-related and a linear cairn as an enclosure bank.'
>
> Andy Jones, 2008, 153.

Apart from Leskernick the only settlement excavations on Bodmin Moor to have been fully published are those on Stannon Down, which was excavated first by Roger Mercer (1970) and then by the Cornwall Archaeological Unit. (I am particularly interested in site 6, upon which a radically new interpretation of the site was substantially based — Jones, 1998; 2006). As we have seen, descriptions of the soils and sediments show them to closely correspond to those excavated at Leskernick and they provide a useful comparative study.[3]

Mercer

A major difference between the houses excavated by Mercer at Stannon Down and those excavated at Leskernick is the nature of the cut features identified. He identified a 'plethora of small post-holes... too many to have all been in use at one time', numerous gullies, some of which were covered, and some larger post-holes, some of them packed, which formed post-rings and porch structures. Some post-holes looked re-cut. Additionally, ditches surrounded at least two houses (Mercer, 1970, 21–6) (Fig. 12). Why the difference between these two sites? Possibly conditions at Leskernick differed from those at Stannon Down in a way that did not favour such preservation the former: as we have seen, all three excavated structures at Leskernick were riddled with burrows. But in view of the two sites' similar locations and the preservation in Houses 1 and 39 and 'House' 23 at Leskernick of identifiable cut features this seems unlikely. It could be that the nature of the buildings, and therefore their internal arrangements, differed, as appears to have been the case with 'House' 23 and — possibly — the circular structures excavated by the Cornwall Archaeological Unit at Stannon Down. *Or* it could be that some features have been misidentified. Interpreting excavated buildings depends, in part, on the *feel* of the excavator and, in part, his identification of trends. At Stannon Down, this would undoubtedly apply to the internal arrangements suggested by Mercer for his structures (1970, 25): one bench or bed-like arrangement of cuts may be fortuitous, but we would expect many to have some cultural reality. However, he provided no other corroborative data. Two cut features only are sectioned, both linear (Mercer, 1970, fig. 10); and his plans show curvilinear cuts (e.g. Fig. 12) identical to features excavated at Leskernick, which appeared to have been formed when burrows coalesced, and whose humic fills showed them definitely to post-date acidification on the moor. The possible consequences of this for his reconstructions and, therefore, our understanding of Bronze Age houses on the moor are profound. *Possibly* at *both* sites the excavated buildings' original ground plans were alike, i.e., for the most part, internal cut features comprised structural members only.

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[3] In fairness to the excavators of these sites, I should emphasise that this is a textual analysis, and that I have discussed neither in *detail* with the excavators themselves. As much as anything else, I present them as an example of why, as I said in my introduction, it is necessary clearly to *write* the 'language of natural processes.'

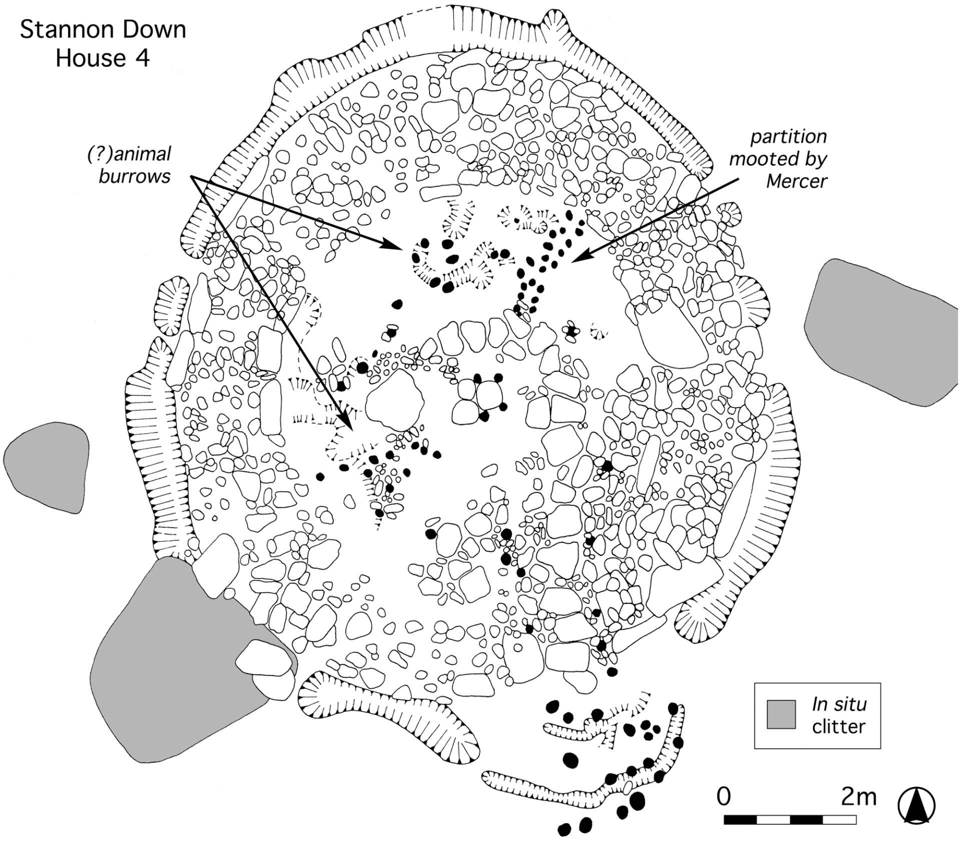

Figure 12.

House 4, Stannon Down (adapted from Mercer 1970, fig. 9). Cf. Fig. 11. *Drawing: Jane Russell.*

The same is suggested of the Bronze Age houses excavated at Heatree on Dartmoor, the plans of which show a similar proliferation of 'stakeholes'. For very different reasons — apparently they were identified by feel as much as anything else — the author of the report expressed doubts about their reality but because they were concentrated away from the centre of the houses and appeared not to have a random lay-out she gave them the benefit of the doubt (Quinnell, 1991, 19). But the area in which they were concentrated was in one house at least exactly that in which our excavations at Leskernick showed burrowing activity to concentrate — under the wall tumble (Quinnell, 1991, fig. 2) — and it seems very probable that they too are burrows.

Cornwall Archaeological Unit

The interpretation of the former Cornwall Archaeological Unit's site 6 is both more problematic and more interesting. Like the houses already discussed, it comprised a circular wall, inside of which was a partial post-ring (Fig. 13). According to the excavator, however, the wall was continuous, incorporating rather than breaking at a very large, flat, earth fast stone, while the post ring was cut into the fill of a large cut hollow encircled by the wall. The much-burrowed fill of this hollow was charcoal rich and one of the few contexts on the site to produce artefactual material. Both it and the post-holes were overlain by 'gritty, black peaty material' and then by 'peat' (Jones, 1998, 11–13, 42). The excavator's interpretation of the building as a ringcairn rather than a house is based on the lack of house-like of features such as 'a doorway, a hearth, the internal postholes and drains, recorded in other excavations' (Jones, 1998, 33).

The key to this interpretation is the level of the Bronze Age landsurface. The profile excavated — a humic layer (the excavator's peat), gritty black material, a much-

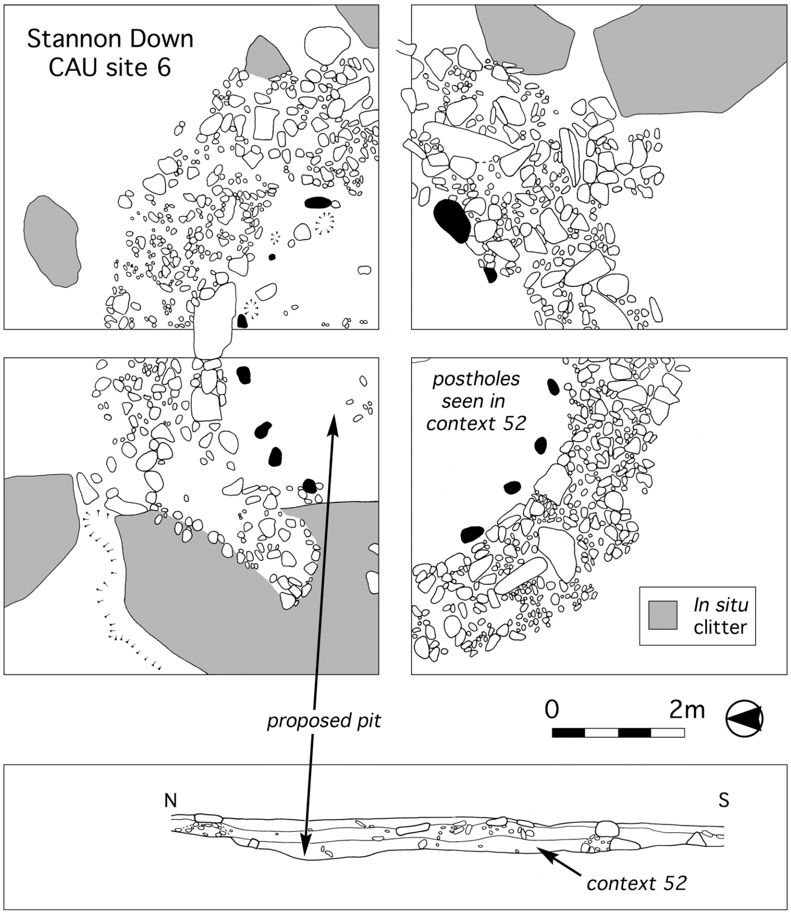

Figure 13.

House or cairn? CAU Site 6, Stannon Down. Although it is not now possible to *prove* it, the sedimentology of this site, believed by its excavator to be a cairn, provides strong *circumstantial* evidence that in fact it is a bog-standard Bronze Age house (adapted from Jones 1998). *Drawing: Jane Russell*

burrowed layer, rab — is very similar to that which occurred in the three buildings excavated at Leskernick and closely resembles that described and illustrated by Mercer at Stannon Down (1970, 25: fig. 10) and by Dudley at Bodrifty (1956) (Fig. 3). In both these cases, the top of the gritty black material (the Ah/ E horizon) marked the prehistoric landsurface. A number of factors combine to suggest that this may be the case with the Cornwall Archaeological Unit's site 6 as well. Firstly, many of the post-holes in the partial post ring are too shallow to be viable. Possibly, therefore, they were cut from a higher level. If this level was or subsequently became pedologically active, it is unlikely that excavation would have picked them up. Secondly, photographs of the wall show a partially clast-supported stone structure; whereas that part of the 'wall' abutted by the gritty black material apparently comprised matrix-supported stone (Jones, 1998, figs 6 & 8). Apart from being structurally unsound (cf. Quinnell, 1991, 17), this also resembles sections excavated at Leskernick, except that at Leskernick the matrix supported stones were in every case *beneath* the wall. No reference is made in the report to a difference in colour between this matrix supported 'wall' and the gritty black layer (the wall was not described) but, given the differences noted above between the colour of developed soils buried beneath prehistoric stone features and the colour of soils unprotected by structures erected prior to acidification, such a difference is *possible*. It would explain its misidentification. Finally, photographs show a concentration of horizontally orientated stones, indicative of a surface, at the interface between the peat and the gritty black material but *nowhere else*, again exactly paralleling the observed stratigraphy at Leskernick.

All this of course implies that the identification of the primary hollow is incorrect. If there was in fact a clear, deliberately made cut, there would be no more to be said. To quote the excavator: '... it would be an exceptionally large area to have been generated by animal disturbance. The hollow and the fill within was entirely contained within the walling of the cairn ring and [the] bottom of the hollow was quite even — so again I would suggest that this is pretty neat work for burrowing animals to have undertaken. The infill within the hollowed area overlay features and was cut by definite features. We also had some artefacts from the infill material' (Andy Jones, pers. comm.). If I am right, however, we validly turn the site's current interpretation on its head. The flat top of the large earthfast stone and the structure's floor would be on the same level, and the structure's wall, rather than incorporating it, would break at it. Just as in House 1 at Leskernick, it would appear that the building's doorway was located over a 'natural' stone that became its threshold. Walls and post-ring would reference only each other, not a pre-existing hollow. Superficial features, such as hearths, would — if they occurred at all — be obscured by the soil processes active on the moor; and material from them incorporated into the underlying sediments by a constant process of burrowing, back filling and collapse. Thus the evidence upon which site 6's current identification is based disappears and we can begin to re-define it in terms of its similarity to other buildings on the moor.

LOST HORIZONS

There is a perception amongst some field archaeologists that practical knowledge gained in the field is not transferable from one region to another. We know our own patch best. In southeast England, where I come from, we're experts excavating the Chalk, in Cambridgeshire they're good at peat and gravels, and in London, deep urban stratigraphies. But dump any of us on the moor, and like the soldiers on exercise who occasionally wandered out of the mist to ask directions at Leskernick, we're lost.

Insofar as the understanding of some excavators is intuitive, and their intuition primed by experience in a particular environment, this is sometimes true. But the techniques that we have to elucidate the nature of sites and identify features, such as the machining of open areas and the section, are viable in most environments, and an understanding of the natural laws that govern sediment deposition and soil development are universally relevant. But you have really to understand the techniques — its not good enough to apply them by rote — and you have to understand the soil. Irrespective of the geology on which a site is located the same themes apply. If it has not been buried, a prehistoric landsurface will have been subject to later soil development, it will have been bioturbated, and any features surviving in it will be defined macroscopically by the difference between them and the site's 'natural' — be it degraded granite or clitter, as it is on the moor, or something else. In areas used for arable agriculture, ploughing on the majority of sites will have destroyed the land surface and the upper parts of any features cut into it, but below most ploughsoils is usually a horizon a few centimetres deep in which all but stone-packed and finds-rich features are invisible (e.g. Seager Thomas, 2010, 8–9, fig. 1). This is what remains of the equivalent of our moorland B-horizons. Owing to the absence of colourful horizonation, soil development is less visible than on the moor, but it has a significant impact nonetheless. But for the most part what we actually see are animal activity, geology and geomorphology. On clayey geologies features may be very difficult to identify, particularly when dry weather has turned everything to a uniform buff colour. Many will be missed. Conversely, a locally inhomogeneous geology may mimic features, while the same inhomogeneities redeposited may mimic other kinds of archaeological feature (e.g. features with multiple fills — cf. Seager Thomas, 2005, 92–4).

The danger is obvious. Off the moor, as on it, we must fully acquaint ourselves with the nature of the geology on which a site is located and the processes to which this is subject before we can expect fully to understand it. Such considerations however are not normally entered into during the discussion of sites, and their interpretation is impoverished accordingly. For the same reason, it is unacceptable for an excavator to base interpretation on *feel* alone — just as it would be, say, for a post-processual theorist. Hence the multi-disciplinary nature of, and my role in, the Bodmin Moor Bronze Age Landscapes Project.

THE LAST WORD?

> ‘Looking back over the past three weeks I feel that little has happened to make me change the way I view archaeology. One thing is sure and that is that consensus management does not work and too many cooks tend to turn the broth sour, especially when one of them has pretensions to “Cordon Bleu” status.’
>
> Eric Jones, House 39 trench diary, 1997 — final page

Thanks Eric!

We completely resolved the issue of moorland stratigraphy and the reader therefore can have complete confidence in the results of our excavations and in the interpretations that follow from them. Well, not quite. I am confident of the reality of the features described and illustrated here but there were others of whose interpretation we could never be sure. During the final excavation seasons the identification of each context was assigned a ‘confidence rating’. By this time we had acquired a good understanding of moorland stratigraphy and could reasonably be expected to identify those features that survived and yet out of 133 contexts excavated in House 1, only 59 had a confidence rating of seventy-five percent or more, while a massive 61 had a confidence rating of between fifty and seventy-five percent and 13 a confidence rating of less than fifty percent, i.e. no confidence at all. It is true that the identification of a number of contexts in the middle range were confirmed later by associations with features or groups of features which at the time their rating was assigned had not been found but others remained unidentified. In the end there were just too many superimposed layers to read them clearly.

This uncertainty contrasts with the apparently much clearer stratigraphy of many other Bronze Age sites in Cornwall, particularly those off the moor like Gwithian, on which several discrete occupation horizons were separated by wind blown sand (Thomas, 1958; Megaw, Thomas & Wailes, 1960–1), and some of the sites excavated in recent years by the former Cornwall Archaeological Unit (e.g. Nowakowski, 1991). How can we validly use data from Leskernick to criticise — in the broadest sense — a Bronze Age archaeology founded upon data from these sites? Apart from the specifically moorland perspective, it is not immediately obvious what it has to offer.

To answer this it is necessary to consider both the nature of field archaeology and its interpretative methodology. In my view, a view I share with a growing number of colleagues, what we see in these reports is something of a front, a construct, resulting from a mixture of professional machismo — the field archaeologist reluctant to express an honest doubt — and a desire for readable and professionally marketable copy. I have already indicated that no site is straightforward stratigraphically. The difference here is interpretative. A feature is a posthole because it completes a post ring, not because it looks like a posthole. Its difference from or similarity to other postholes is only meaningful in this interpretative context. Leskernick approached in this way would have segued easily into a pre-existing Cornish Bronze Age; it has all the components —

roundhouses, gabbroic pottery, accretional field systems. But although we too looked forward to a coherent final product, and although our use of open area excavations *versus* sections, was thoroughly conventional, we were not at all macho in our professional outlook and preferred to give equal weight to those things for which there was a pre-existing interpretation and to those things *for which there was not*. The result is what you see here.

Acknowledgments: The author would like to thank Professor Sue Hamilton for inviting him onto the Bodmin Moor projects, and those others — excavators, illustrators and photographers — with whom he worked at Leskernick. It was a hard 18 weeks and they know their worth. I am also grateful to Drs Jean-Pierre Airoldi and Andy M. Jones for permission to adapt figures from their publications, and to those others whose personal comments have enriched my text. The Bodmin Moor Bronze Age Landscapes project fieldwork discussed here was funded by the British Academy, the Institute of Archaeology, UCL, and the Prehistoric Society.

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UNUSED IMAGES

House 39

Northern Stone Circle